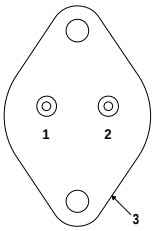
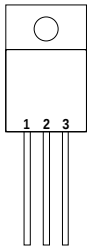
SEME LAB

IP1R17A
IP3R17A
IP1R17
IP3R17



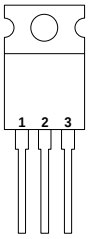
Pin 1 – Ground
Pin 2 – V_{OUT}
Case – V_{IN}

K Package – TO–3



Pin 1 – Ground
Pin 2 – V_{IN}
Pin 3 – V_{OUT}
Case – V_{IN}

G Package – TO–257



Pin 1 – Ground
Pin 2 – V_{IN}
Pin 3 – V_{OUT}
Case – V_{IN}

T Package – TO–220

3 AMP FIXED NEGATIVE VOLTAGE REGULATORS

FEATURES

- **0.01%/V LINE REGULATION**
- **0.5% LOAD REGULATION**
- **±1% OUTPUT TOLERANCE (–A VERSIONS)**
- **AVAILABLE IN –5V, –12V AND –15V OPTIONS**
- **COMPLETE SERIES OF PROTECTIONS:**
  - **CURRENT LIMITING**
  - **THERMAL SHUTDOWN**
  - **SOA CONTROL**

Order Information

Part Number	K–Pack (TO–3)	G–Pack (TO–257)	T–Pack (TO–220)	Temp. Range
IP1R17Axx–zz	✔	✔		-55 to +150°C
IP1R17xx–zz	✔	✔		”
IP3R17Azz–xx	✔		✔	0 to +125°C
IP3R17zz–xx	✔		✔	”

Note:

xx = Voltage Code (05, 12, 15)
zz = Package Code (G, K, T)

eg.
IP1R17AK–05
IP3R17G–12

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C unless otherwise stated)

V_I	DC Input Voltage	35V
P_D	Power Dissipation	Internally limited
T_J	Operating Junction Temperature Range	See Table Above
T_{STG}	Storage Temperature Range	–65°C to +150°C
T_L	Lead Temperature (Soldering, 10 sec)	300°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise stated)

Parameter		Test Conditions [2]	IP1R17A–05 IP3R17A–05 Min.	Typ.	Max.	IP1R17–05 IP3R17–05 Min.	Typ.	Max.	Units
			-5.05	-5	-4.95	-5.15	-5	-4.85	V
V_O	Output Voltage	I_O = -5mA to -3A $P \le P_{MAX}$ V_{IN} = -8V to -20V T_J = Over Temp. Range [1]	-5.15		-4.85	-5.25		-4.75	V
$\frac{\Delta V_O}{\Delta V_I}$	Line Regulation	V_{IN} = -7.5V to -35V		3	15		6	30	mV
		I_O = -5mA [3] T_J = Over Temp. Range [1]		6	30		12	60	
$\frac{\Delta V_O}{\Delta I_O}$	Load Regulation	I_O = -5mA to -3A [3]		5	25		10	50	mV
		T_J = Over Temp. Range [1]		10	50		20	100	
I_Q	Quiescent Current	I_O = -5mA T_J = Over Temp. Range [1]			5			5	mA
ΔI_Q	Quiescent Current Change	I_O = -5mA to -3A T_J = Over Temp. Range [1]			10			10	mA
		I_O = -5mA V_{IN} = -7.5V to -35V T_J = Over Temp. Range [1]			5			5	
V_D	Dropout Voltage	I_O = -3A ΔV_{OUT} = 100mV T_J = Over Temp. Range [1]		2.2	3		2.2	3	V
	Ripple Rejection	I_O = -1A f = 120Hz T_J = Over Temp. Range [1]	60	80		60	80		dB
	Thermal Regulation	t_p = 20ms $\Delta P = P_{MAX}$		0.002	0.01		0.002	0.02	%/W
I_{PEAK}	Peak Output Current	V_{IN} = -10V T_J = Over Temp. Range [1]	-6.5	-4.5		-6.5	-4.5		A
I_{SC}	Short Circuit Current	V_{IN} = -10V		-4			-4		A
		V_{IN} = -35V		-1			-1		
e_n	Output Noise Voltage	f = 10Hz to 100kHz		40			40		µV
$R_{\theta JC}$	Thermal Resistance Junction to Case	K Package		1.5	2.5		1.5	2.5	°C/W
		G, T Package		3	4		3	4	

Notes

1) Applies over full temperature range:–
   T_J = –55 to +150°C for IP1R17A–05 / IP1R17–05
   T_J = 0 to +125°C for IP3R17A–05 / IP3R17–05
   All other specifications apply at T_C = 25°C unless otherwise stated.

2) Test conditions unless otherwise stated:–
   V_{IN} = -10V , I_{OUT} = -1.5A .
   Although Power Dissipation is internally limited, these specifications apply for Power Dissipation up to 30W for the TO–3 Package, and 20W for the TO–220 and TO–257 Packages.

3) Load and Line regulation are electrically independent and are measured using pulse techniques at low duty cycle in order to maintain constant junction temperature. To determine the effects on the output voltage due to device heating, refer to thermal regulation specification.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter		Test Conditions [2]	IP1R17A–12 IP3R17A–12 Min.	Typ.	Max.	IP1R17–12 IP3R17–12 Min.	Typ.	Max.	Units
			-12.12	-12	-11.88	-12.36	-12	-11.64	V
V_O	Output Voltage	I_O = -5mA to -3A $P \le P_{MAX}$ V_{IN} = -15V to -27V T_J = Over Temp. Range [1]	-12.36		-11.64	-12.60		-11.40	V
$\frac{\Delta V_O}{\Delta V_I}$	Line Regulation	V_{IN} = -14.5V to -35V		5	30		10	60	mV
		I_O = -5mA [3] T_J = Over Temp. Range [1]		10	60		20	120	
$\frac{\Delta V_O}{\Delta I_O}$	Load Regulation	I_O = -5mA to -3A [3]		10	60		20	120	mV
		T_J = Over Temp. Range [1]		20	120		40	240	
I_Q	Quiescent Current	I_O = -5mA T_J = Over Temp. Range [1]			5			5	mA
ΔI_Q	Quiescent Current Change	I_O = -5mA to -3A T_J = Over Temp. Range [1]			10			10	mA
		I_O = -5mA V_{IN} = -14.5V to -35V T_J = Over Temp. Range [1]			5			5	
V_D	Dropout Voltage	I_O = -3A ΔV_{OUT} = 250mV T_J = Over Temp. Range [1]		2.2	3		2.2	3	V
	Ripple Rejection	I_O = -1A f = 120Hz T_J = Over Temp. Range [1]	52	72		52	72		dB
	Thermal Regulation	t_p = 20ms $\Delta P = P_{MAX}$		0.002	0.01		0.002	0.02	%/W
I_{PEAK}	Peak Output Current	V_{IN} = -17V T_J = Over Temp. Range [1]	-6.5	-4.5		-6.5	-4.5		A
I_{SC}	Short Circuit Current	V_{IN} = -17V		-2.5			-2.5		A
		V_{IN} = -35V		-1			-1		
e_n	Output Noise Voltage	f = 10Hz to 100kHz		75			75		µV
$R_{\theta JC}$	Thermal Resistance Junction to Case	K Package		1.5	2.5		1.5	2.5	°C/W
		G, T Package		3	4		3	4	

Notes

1) Applies over full temperature range:–
   T_J = –55 to +150°C for IP1R17A–12 / IP1R17–12
   T_J = 0 to +125°C for IP3R17A–12 / IP3R17–12
   All other specifications apply at T_C = 25°C unless otherwise stated.

2) Test conditions unless otherwise stated:–
   V_{IN} = -17V , I_{OUT} = -1.5A .
   Although Power Dissipation is internally limited, these specifications apply for Power Dissipation up to 30W for the TO–3 Package, and 20W for the TO–220 and TO–257 Packages.

3) Load and Line regulation are electrically independent and are measured using pulse techniques at low duty cycle in order to maintain constant junction temperature. To determine the effects on the output voltage due to device heating, refer to thermal regulation specification.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

Parameter		Test Conditions [2]	IP1R17A–15 IP3R17A–15 Min.	Typ.	Max.	IP1R17–15 IP3R17–15 Min.	Typ.	Max.	Units
			-15.15	-15	-14.85	-15.45	-15	-14.55	V
V_O	Output Voltage	I_O = -5mA to -3A $P_{OUT} \leq P_{MAX}$ V_{IN} = -18V to -30V T_J = Over Temp. Range [1]	-15.45		-14.55	-15.75		-14.25	V
$\frac{\Delta V_O}{\Delta V_I}$	Line Regulation	V_{IN} = -17.5V to -35V		8	40		16	80	mV
		I_O = -5mA [3] T_J = Over Temp. Range [1]		16	80		32	160	
$\frac{\Delta V_O}{\Delta I_O}$	Load Regulation	I_O = -5mA to -3A [3]		16	80		32	160	mV
		T_J = Over Temp. Range [1]		32	160		64	320	
I_Q	Quiescent Current	I_O = -5mA T_J = Over Temp. Range [1]			5			5	mA
ΔI_Q	Quiescent Current Change	I_O = -5mA to -3A T_J = Over Temp. Range [1]			10			10	mA
		I_O = -5mA V_{IN} = -17.5V to -35V T_J = Over Temp. Range [1]			5			5	
V_D	Dropout Voltage	I_O = -3A ΔV_{OUT} = 300mV T_J = Over Temp. Range [1]		2.2	3		2.2	3	V
	Ripple Rejection	I_O = -1A f = 120Hz T_J = Over Temp. Range [1]	50	70		50	70		dB
	Thermal Regulation	t_p = 20ms $\Delta P = P_{MAX}$		0.002	0.01		0.002	0.02	%/W
I_{PEAK}	Peak Output Current	V_{IN} = -20V T_J = Over Temp. Range [1]	-6.5	-4.5		-6.5	-4.5		A
I_{SC}	Short Circuit Current	V_{IN} = -20V		-2.3			-2.3		A
		V_{IN} = -35V		-1			-1		
e_n	Output Noise Voltage	f = 10Hz to 100kHz		90			90		µV
$R_{\theta JC}$	Thermal Resistance Junction to Case	K Package		1.5	2.5		1.5	2.5	°C/W
		G, T Package		3	4		3	4	

Notes

1) Applies over full temperature range:–
   T_J = –55 to +150°C for IP1R17A–15 / IP1R17–15
   T_J = 0 to +125°C for IP3R17A–15 / IP3R17–15
   All other specifications apply at T_C = 25°C unless otherwise stated.

2) Test conditions unless otherwise stated:–
   V_{IN} = -20V , I_{OUT} = -1.5A .
   Although Power Dissipation is internally limited, these specifications apply for Power Dissipation up to 30W for the TO–3 Package, and 20W for the TO–220 and TO–257 Packages.

3) Load and Line regulation are electrically independent and are measured using pulse techniques at low duty cycle in order to maintain constant junction temperature. To determine the effects on the output voltage due to device heating, refer to thermal regulation specification.